

CLAIMS

1. A sample cutting and handling apparatus for excising one or more samples from an array of samples including:
 - at least one cutting head mounted on the apparatus for movement in X, Y and Z directions by an automated control system for excising a sample from the array;
 - one or more liquid aspiration and delivery outlet means for dispensing liquids onto the array of samples;
 - a movable head mounted on an automated motion control system for controlling movement of the moveable head in X, Y, and Z directions;
 - at least one displacement means connected to a liquid supply means and to one or more of the liquid aspiration and delivery outlet means via a valve means for causing the dispensing of liquid from the one or more liquid aspiration and delivery outlet means;
 - wherein at least one displacement means and the one or more liquid aspiration and delivery outlet means are carried by the moveable head.
2. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 1 wherein at least one displacement means comprises a syringe and at least one liquid aspiration and delivery outlet means comprises a pipette which is capable of receiving a removable tip.
3. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 2 wherein a plurality of syringes are mounted in parallel on the movable head.
4. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 3 wherein the syringes and the outlets are mounted on opposite sides of an axis of movement of the apparatus along which the movable head is arranged to travel.
5. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 1 wherein a reservoir is connected to the movable head by a single tube for supplying liquid to at least one displacement means.
6. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 4 wherein eight or more syringes are mounted along parallel axes which, in use, are generally vertically oriented.

7. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 1 wherein the device for dispensing liquids is located on the same movable head as at least one cutting head.

8. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 2 wherein a clutch means is provided on the axis of movement of the syringes which when disengaged fixes the cylinders relative to the pistons of the syringes so that as the head moves up and down the piston and syringe body move together, and when engaged releases the body of the syringe relative to the piston such that as the module moves up and down in the vertical direction, the piston moves relative to the syringe body.

9. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 2 wherein one or more valves are provided for controlling the flow of liquid to and from the syringes.

10. A sample cutting and handling apparatus for excising one or more samples from an array of samples including:

- at least one cutting head mounted on the apparatus for movement in X, Y and Z directions by an automated control system for excising a sample from the array;

- a plurality of pipettes for dispensing liquids onto the array of samples;
- a movable head mounted on an automated motion control system for controlling movement of the moveable head in X, Y and Z directions;

- a plurality of syringes, each syringe being connected to a liquid supply means and to one of the pipettes via a valve means for causing the dispensing of liquid from the one or more liquid aspiration and delivery outlet means;

- wherein both the syringes and the pipettes are carried by the moveable head, and wherein the syringes and the pipettes are mounted on opposite sides of the x-axis of movement of the apparatus along which x-axis the movable head is arranged to travel.

11. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 10 wherein a reservoir is connected to the movable head by

a single tube for supplying liquid to the syringes.

12. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 11 wherein the device for dispensing liquids is located on the same moveable head as at least one cutting head.

13. A sample cutting and handling apparatus for excising one or more samples from an array of samples including:

- at least one cutting head mounted on the apparatus for movement in X, Y and Z directions by an automated control system for excising a sample from the array;

- one or more liquid aspiration and delivery outlet means for dispensing liquids onto the array of samples;

- a movable head mounted on an automated motion control system for controlling movement of the moveable head in X, Y and Z directions;

- a plurality of syringes connected to a liquid supply means, each syringe also being connected to one of the liquid aspiration and delivery outlet means via a valve means for causing the dispensing of liquid from the one or more liquid aspiration and delivery outlet means;

- wherein both the syringes and the one or more liquid aspiration and delivery outlet means are carried by the moveable head, wherein the syringes and the outlets are mounted on opposite sides of an x axis of movement of the apparatus along which the moveable head is arranged to travel; and

- wherein a reservoir is connected to the moveable head by a single tube for supplying liquid to at least one displacement means.

14. The sample cutting and handling apparatus for dispensing liquids as claimed in claim 13 wherein the device for dispensing liquids is located on the same movable head as at least one cutting head.